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AUTHOR(S):

Ishibashi, Masayoshi; Ueda, Shunzo; Yamamoto, Yoshikazu

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Cobalt Content of Shallow-water Deposits. (1)

Masayoshi ISHIBASHI, Shunzo UEDA and Yoshikazu YAMAMOTO*

(Ishibashi Laboratory)

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The authors have collected about 140 kinds of the deposits along the sea-coasts of Korea and Honshū (Japan), and determined the cobalt content of these samples.

In this paper, the cobalt content of 81 kinds of the deposits from the sea-coasts of Honshū is reported.

INTRODUCTION

M. Ishibashi[1], one of the authors, discovered and confirmed the fertilizing property of the shallow-water deposits and pointed out the practicability of applying these deposits to farms for the purpose of enriching the soil. Since then we collected about 140 samples in the neighbourhood of the shorelines around Korea and Japanese Main Island and made experiments for a long time in order to elucidate the principal causes of the fertilizing property and to draw a map of the distribution of the chemical constituents in these shallow-water deposits. So far the contents of common elements and rare or minor elements such as radium, vanadium, chromium and nickel in these samples have been determined and reported from time to time[2].

This time we have determined the cobalt content of the same samples. In this paper, the analytical results of 81 kinds of deposits from the sea-coasts of Japnnese Main Island are described.

EXPERIMENTAL PROCEDURE AND RESULTS

For the determination of cobalt, Sandell's colorimetric method[3] was employed. Samples were decomposed with hydrofluoric-perchloric acid and cobalt was extracted from the ammoniacal citrate solution with dithizone in carbon tetrachloride. The carbon tetrachloride extracts were evaporated to dryness and the residue was treated with perchloric-sulfuric acid to destory organic matter. Then citric acid solution, phosphate-boric acid buffer and nitroso-R salt solution were added, and cobalt was determined colorimetrically after being treated with nitric acid.

The analytical results are shown in Table 1, in which the nickel content[4] is also cited for the purpose of investigating the relation of cobalt to nickel.

The discussion of the results will be presented in the next paper together with those of other experiments.

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* 石橋雅義，上田俊三，山本善一

Table 1. Cobalt Content of the shallow-water deposits.*

Sample No.	Locality	Type of deposits	Co content 10^{-3}%	Ni content 10^{-3}%	Co/Ni
1	Ataka-machi, Komatsu-shi, Ishikawa-ken	Light brown sand	0.2	0.5	0.40
2	Mukōawagasaki, Uchinada-mura, Kahoku-gun, Ishikawa-ken	Brown sand	0.3	0.7	0.43
3	Takahama, Takahama-machi, Hakui-gun, Ishikawa-ken	Light brown sand	0.5	0.9	0.56
4	Ōkawa, Machino-machi, Fugeshi-gun, Ishikawa-ken	Blackish sand	0.6	2.4	0.25
5	Fujinami, Sannami-mura, Fugeshi-gun, Ishikawa-ken	Blackish sand	0.7	1.9	0.37
6	Mattō, Nanao-shi, Ishikawa-ken	Light grayish brown sand	0.2	1.4	0.14
7	Kubo, Kubo-mura, Himi-gun, Toyama-ken	Light brown sand	0.6	0.6	1.00
8	Ebie, Ebie-mura, Imizu-gun, Toyama-ken	Light grayish brown sand	0.2	0.5	0.40
9	Shimomuraki-machi, Uozu-machi Shimoniikawa-gun,Toyama-ken	Light yellowish sand	0.1	0.6	0.17
10	Ikuzi-machi, Shimoniikawa-gun, Toyama-ken	Small gravel	n.d.	n.d.	—
11	Shimoarahama, Yachiho-mura, Nakakubiki-gun, Niigata-ken	Grayish white sand	0.5	1.0	0.50
12	Kuziranami, Kashiwazaki-shi, Niigata-ken	Blackish brown sand	0.9	1.1	0.82
13	Amaze, Izumozaki-machi, Santō-gun, Niigata-ken	Brown sand	0.2	1.4	0.14
14	Kawakami, Ikarashihama, Uchino-machi, Nishikambara-gun, Niigata-ken	Grayish white sand	0.8	1.2	0.67
15	Muramatsuhama, Matsuzuka-mura, Kitakambara-gun, Niigata-ken	Grayish white sand	0.3	1.1	0.27
16	Aburato, Kamo-machi, Nishitagawa-gun, Yamagata-ken	Grayish sand	0.5	1.0	0.50
17	Miyaumi, Nishiarase-mura, Akuumi-gun, Yamagata-ken	Grayish white sand	0.1	0.8	0.13
18	Yoshigo, Tahara-machi, Atsumi-gun, Aichi-ken	Grayish green fine mud	0.6	3.4	0.18
19	Ura, Tahara-machi, Atsumi-gun, Aichi-ken	Grayish green fine mud	1.0	7.5	0.13
20	Namiirie, Oitsu-mura, Atsumi-gun, Aichi-ken	Grayish green sandy mud	0.5	2.1	0.24
21	Nakane, Terazu-machi, Hazu-gun, Aichi-ken	Grayish green sandy mud	0.3	1.2	0.25
22	Yoshihama, Takahama-machi, Hekikai-gun, Aichi-ken	Grayish green fine mud	0.7	1.6	0.44
23	Ishikiri, Kamezaki, Handa-shi, Aichi-ken	Grayish green sandy mud	0.3	0.7	0.43
24	Nawa, Ueno-machi, Chita-gun Aichi-ken	Grayish green mud	0.5	1.0	0.50
25	Sankaku, Shimonoishiki-machi, Nakagawa-ku, Nagoya-shi, Aichi-ken	Grayish green fine mud	0.8	1.8	0.44
26	Shingai-machi, Fukuyama-shi, Hiroshima-ken	Grayish green fine mud	0.9	1.5	0.60

* Results are shown on the sea-salt-free and dry basis.

27	Minomi-machi, Numakuma-gun, Hiroshima-ken	Grayish green fine mud	1.1	1.4	0.79
28	Yoshiwa-machi, Onomichi,-shi, Hiroshima-ken	Grayish green mud	0.3	1.0	0.30
29	Nouji, Saizaki-machi, Toyota-gun Hiroshima-ken	Yellowish white sand	0.1	0.3	0.33
30	Miyatoko, Tadanoumi-machi, Toyota-gun, Hiroshima-ken	Light brown sand	0.1	0.06	1.67
31	Kitazaki, Takehara-machi, Kamo-gun, Hiroshima-ken	Grayish green fine mud	0.5	1.6	0.31
32	Kirasaki, Shimono-mura, Kamo-gun, Hiroshima-ken	Grayish green mud	0.2	1.5	0.13
33	Mitsu, Akitsu-machi, Kamo-gun, Hiroshima-ken	Light grayish brown sand	0.08	0.09	0.89
34	Tsukimigahama, Itsukaichi, Itsukaichi-machi, Saeki-gun, Hiroshima-ken	Light brown sand	0.07	0.2	0.35
35	Karasumori, Uchimichikawa, Michikawa-mura, Yuri-gun, Akita-ken	Grayish white sand	0.2	0.3	0.67
36	Shimodeto, Tennō-mura, Minamiakita-gun, Akita-ken	Brown sand	0.3	0.7	0.43
37	Minamihirasawa, Funagawaminato-machi, Minamiakita-gun, Akita-ken	Grayish white sand	0.2	1.0	0.20
38	Miyasawa, Katanishi-mura, Minamiakita-gun, Akita-ken	Brown sand	0.2	0.5	0.40
39	Kohama, Kurosaki, Iwasaki-mura, Nishitsugaru-gun, Aomori-ken	Grayish white sand	0.2	0.3	0.67
40	Isouchi, Rokumaibashi Ushirogata-mura, Higashitsugaru-gun, Aomori-ken	Blackish sand	1.0	0.8	1.25
41	Asadokoro, Kominato-machi, Higashitsugaru-gun, Aomori-ken	Grayish sand	0.3	0.9	0.33
42	Uwano, Ōhata, Ōhata-machi, Shimokita-gun, Aomori-ken	Grown sand	0.5	0.4	1.25
43	Tomari, Rokukasho-mura, Kamikita-gun, Aomori-ken	Blackish brown sand	0.8	1.1	0.73
44	Hitokawame, Momoishi-machi, Kamikita-gun, Aomori-ken	Blackish sand	1.6	2.0	0.80
45	Tamakawa, Noda-mura, Kunohe-gun, Iwate-ken	Grayish white sand	0.3	1.6	0.19
46	Fujiwara, Miyako-shi, Iwate-ken	Blackish sand	1.0	3.6	0.28
47	Tsugaruishi-mura, Shimohei-gun, Iwate-ken	Grayish white sand	0.5	1.7	0.29
48	Orikasa-mura, Shimohei-gun, Iwate-ken	Dark grayish sandy mud	0.8	2.9	0.28
49	Akasawa, Ōfunato-machi, Kesen-gun, Iwate-ken	Blackish sand	1.4	1.9	0.74
50	Okiura, Higashikatakami, Katakami-machi, Wake-gun Okayama-ken	Dark grayish green fine mud	0.6	1.7	0.35
82	Awarigō, Nagahama-mura, Oku-gun, Okayama-ken	Grayish green sandy mud	0.7	1.2	0.58
51	Nishitakasaki, Nadasaki-mura, Kojima-gun, Okayama-ken	Grayish green fine mud	1.6	4.0	0.40
52	Nishitakasaki, Nadasaki-mura, Kojima-gun, Okayama-ken	Grayish green fine mud	1.6	4.0	0.40
53	Ōsaki, Hachihama-machi, Kojima-gun, Okayama-ken	Grayish green fine mud	1.3	3.5	0.37
54	Hachihama-machi, Kojima-gun, Okayama-ken	Grayish green mud	0.6	1.7	0.35

55	Yorishima-machi, Asaguchi-gun, Okayama-ken	Grayish green mud	0.5	1.1	0.45
56	Yōsuna, Kanaura-machi, Oda-gun, Okayama-ken	Grayish green mud	0.5	1.2	0.42
57	Yanai-machi, Kuga-gun, Yamaguchi-ken	Grayish green mud	1.4	2.6	0.54
58	Shinzaki, Higashitoyoi, Kudamatsu-shi, Yamaguchi-ken	Grayish white sand	0.3	0.8	0.38
59	Ninomasu, Nakanoseki-machi, Hōfu-shi, Yamaguchi-ken	Yellowish white sand	0.2	0.7	0.29
60	Kiwaura, Higashikiwa-mura, Yoshiki-gun, Yamaguchi-ken	Yellowish white sand	trace	0.4	0
61	Matsuoda, Shimonoseki-shi, Yamaguchi-ken	Light brownish gray sand	0.08	0.2	0.40
62	Ōhibi, Senzaki-machi, Ōtsu-gun, Yamaguchi-ken	Light brown sand	0.1	0.4	0.25
63	Uku, Nago-machi, Abu-gun, Yamaguchi-ken	Grayish sand	trace	0.4	0
64	Asari-mura, Naka-gun, Shimane-ken	Yellowish white sand	0.2	0.3	0.67
65	Yasugi, Yasugi-machi, Nogi-gun, Shimane-ken	Brown sand	0.3	1.0	0.30
66	Yoshizu, Sakitsu-mura, Saihaku-gun, Tottori-ken	Grayish sand	0.7	2.0	0.35
67	Ōshinozu-mura, Saihaku-gun, Tottori-ken	Yellowish white sand	0.2	0.4	0.50
68	Yodoe, Yodoe-machi, Saihaku-gun, Tottori-ken	Grayish sand	0.8	1.2	0.67
69	Ajiro-mura, Iwami-gun, Tottori-ken	Light brown sand	0.2	0.9	0.22
70	Ōkura-machi, Akashi- shi, Hyōgo-ken	Yellowish white sand	0.2	0.8	0.25
71	Shinzaike, Aboshi-ku, Himeji-shi, Hyōgo-ken	Grayish brown sand	0.4	1.3	0.31
72	Naba-machi, Aioi-shi, Hyōgo-ken	Grayish green mud	0.2	1.4	0.14
73	Naba-machi, Aioi-shi, Hyōgo-ken	Grayish green mud	0.3	0.6	0.50
74	Miwasaki-machi, Shingū-shi, Wakayama-ken	Blackish gray sand	0.3	1.3	0.23
75	Hosono, Katata, Nishitonda-mura, Nishimuro-gun, Wakayama-ken	Light brown sandy mud	0.2	0.6	0.33
76	Kitahara, Shinjō-mura, Nishimuro-gun, Wakayama-ken	Light brown sandy mud	0.3	1.0	0.30
77	Minabe-machi, Hidaka-gun, Wakayama-ken	Brown sand	0.3	1.3	0.23
78	Enokoma, Yura-machi, Hidaka-gun, Wakayama-ken	Light brown sand	0.3	0.7	0.43
79	Ōyodo, Ōyodo-machi, Take-gun, Mie-ken	Light grayish brown sand	0.1	0.9	0.11
80	Funakoshi-mura, Shima-gun, Mie-ken	Grayish white sandy mud	0.3	1.0	0.30
81	Nagashima-machi, Kitamuro-gun, Mie-ken	Blackish brown sand	0.4	1.6	0.25

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